Autonomous Vehicles – Liability and Policy Issues

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Subject: Actuarial Science
Article type: Evolution of Auto Insurance Roundtable presentation

While previously relegated to the world of science fiction, the future of personal transportation may be in vehicles that drive themselves, requiring little or no human input. In fact, this development is no longer a question of "if" but is now "when." Several manufacturers are currently developing these vehicles, referred to as "autonomous vehicles." Google has been at the forefront, actively testing autonomous vehicles on public roadways, and now automakers including GM, Volkswagen, Audi and Tesla predict that some form of self-driving cars will be on the roadways within this decade. Various states including California, Florida, Michigan and Nevada have already passed laws authorizing the use of such vehicles on public highways and the National Highway Traffic Safety Administration is currently undertaking work to calculate the safety benefits of automation and has issued recommendations for state legislative activities relating to autonomous vehicles.[1]

A report released by the consulting firm McKinsey & Company projected that the revenue associated with connected-car technology will grow to more than $230 billion by the end of this decade, about a six-fold increase from current levels.[2] The report further predicts that the development of autonomous vehicle technology will result in a redistribution of revenues between automakers and other industry-related companies as opposed to an expansion of the overall revenue pool. While not addressed in that report, the implementation of autonomous vehicle technology will also impact more diversely related industries due to likely shifts in liability schemes, including entities involved in the "crash economy" (such as healthcare providers, attorneys, insurance companies, and auto repair shops).[3]

Why is autonomous vehicle technology now seemingly out of the garage and speeding headlong down the highway? Initially, one factor is that the technology has now reached a maturity level as to where it may begin to be implemented for public use. Further, besides the projected economic benefits seen by the auto industry, this development largely is a reflection of the fact that the perceived benefits are far outweighing perceived risks.[4]

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[1] National Highway Traffic Safety Administration, *Preliminary Statement of Policy Concerning Automated Vehicles* (Washington D.C., May 30, 2013).
[2] Aaron M. Kessler, *Technology Takes the Wheel*, THE NEW YORK TIMES, October 6, 2014, available at http://www.nytimes.com/2014/10/06/business/technology-takes-the-wheel.html?_r=0.
[3] *See* James M. Anderson, Nidhi Kalra, Karlyn D. Stanley, Paul Sorensen, Constantine Samaras, Oluwatobi A. Oluwatola, *Autonomous Vehicle Technology – A Guide for Policymakers,* in RAND CORPORATION RESEARCH REPORT SERIES (2014).
[4] For a fuller assessment of risks and benefits, *see, e.g., id.* at pp. 9 – 40.

Predicted benefits of autonomous vehicle technology include:

- Improve overall safety of the roadways.
  - Over 30,000 people die in the U.S. each year in auto collisions and over 2.2 million crashes result in injury.
  - The technology will improve accident avoidance.
  - The technology will eliminate human failings (intoxication, fatigue, aggressiveness, inexperience, inattention, etc.).
- Increase overall traffic efficiency.
- Reduce the vehicle's carbon emissions by ensuring vehicles are always operating at maximum efficiency.
- Provide accessibility to individuals who otherwise would be unable to utilize vehicles/roadways.
- Increase worker productivity by freeing the driver to multitask during a commute.

Possible negatives of autonomous vehicle technology:

- Increase overall vehicular motor traffic, thereby negatively impacting overall carbon emission.
- Siphon riders from public transportation.
- Result in economic/job losses (e.g. impacting truck drivers, cab drivers, and bus drivers).
- Disrupt "crash economy" (e.g. impacting healthcare providers, attorneys, insurance companies, and auto repair shops).

Factors which may serve to impede or inhibit adoption of autonomous vehicle technology include varying state licensing laws, variances in regulation and other state laws, privacy protection for data, communications issues, human/machine interface issues, insurance issues and U.S. liability laws.[5]

The emergence of autonomous vehicles presents many legal questions, including:

- How liability, absent statutory or regulatory directive, should be assessed and apportioned when an autonomous vehicle, under automatic control, gets into an accident that is not the fault of another vehicle; and
- How the law treats autonomous vehicle liability, while attempting to preserve as many of the benefits as possible, could have substantial effects on the development and safety of the technology.

Statutory and regulatory treatment of autonomous vehicles will play a large role in shaping the future of this technology. Courts will also have a role in shaping the legal treatment of

[5] Id. S*ee also* John Villasenor, *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation,* in CENTER FOR TECHNOLOGY INNOVATION AT BROOKINGS – THE ROBOTS ARE COMING: THE PROJECT ON CIVILIAN ROBOTICS 2 (April 2014).

autonomous vehicles by answering questions not addressed by legislation and/or regulation.

Factors which will impact the anticipated allocation of liability by future legislation and court action will involve both the level of automation of the vehicles and the level of involvement of the human driver. Both are on a defined continuum.

Levels of Automation – A Continuum[6]

- *Level 0 - No-Automation* – The driver remains in complete and sole control of the primary vehicle controls at all times and is solely responsible for both monitoring the roadway and for safe operation of all vehicle controls.

- *Level 1 - Function-specific Automation* – Involves one or more specific control functions. The driver retains overall control, and is solely responsible for safe operation, but can choose to cede limited authority over a primary control. While the vehicle can automatically assume limited authority over a primary control (as in electronic stability control), the driver cannot be disengaged from physically operating the vehicle by having hands off the steering wheel and feet off the pedals at the same time.

- *Level 2 - Combined Function Automation* – Involves automation of at least two primary control functions designed to work in unison to relieve the driver of control of those functions. The driver remains responsible for monitoring the roadway and safe operation of the vehicle and is expected to be available for control at all times and on short notice. The system can relinquish control with no advance warning and the driver must be ready to control the vehicle safely.

- *Level 3- Limited Self-Driving Automation* – The vehicle enables a driver to cede full control of all safety-critical functions under certain traffic or environmental conditions and to rely heavily on the vehicle to monitor for changes in those conditions requiring transition back to driver control. The driver is expected to be available for occasional control, but with sufficient transition time. The vehicle is designed to ensure safe operation during the automated driving mode and the driver is not expected to constantly monitor the roadway while driving.

- *Level 4 - Full Self-Driving Automation* – The vehicle performs all safety-critical driving functions and monitors roadway conditions for the entire trip. Design anticipates that a driver will provide destination or navigation input, but is not expected to be available for control at any time during the trip. In fact this design includes both occupied and unoccupied vehicles. By design, safe operation of the vehicle rests solely on the automated vehicle system.

[6] National Highway Traffic Safety Administration, *Preliminary Statement of Policy Concerning Automated Vehicles* (Washington D.C., May 30, 2013).

Levels of Driver Involvement/Culpability – Another Continuum[7]

All would impact allegation of potential fault and liability in operating an Autonomous Vehicle.

- *The Distracted Driver* – An autonomous car user who is not paying attention, choosing to do something else. The driver is engaging in a task other than driving and is relying on the autonomous vehicle completely.

- *The Diminished Capabilities Driver* – An individual whose driving capabilities are diminished for some reason (e.g., age or intoxication). Typically these individuals would not be driving because of their diminished capabilities

- *The Disabled Driver* – An individual who cannot drive a traditional vehicle because of a physical disability. These drivers rely entirely on the autonomous nature of the car and cannot safely take control of an autonomous vehicle in the event of a computer malfunction.

- *The Attentive Driver* – An individual who is able to and does monitor the road and surroundings as if driving a traditional vehicle. These drivers constantly monitor that the autonomous vehicle is driving correctly and may not have other tasks or distractions to attend to while in the vehicle. These drivers can potentially foresee and prevent accidents.

Current Liability Scenario – Auto Accidents

The law governing crashes is a mixture of state tort law and state laws that mandate insurance for drivers. As a result, the mandatory-insurance regime substantially affects litigation that occurs after crashes.

Current Theories of Driver Liability

- *Traditional Negligence* - Drivers have a duty to take reasonable care in operation of their vehicles. Drivers are liable for injuries that they cause in violation of the duty of reasonable care. An individual driver should be held liable for harms caused by unreasonably failing to prevent the risk.

- *No-fault Liability* - Auto crash victims are not permitted to sue other drivers in the tort system unless their injuries reach a certain degree or threshold of severity. Instead, victims are directly compensated for their losses through their own insurance.

- *Strict Liability* – This theory is applied to situations involving abnormally dangerous or "ultrahazardous" activities of a driver. This rarely applies in an accident setting.

[7] Jeffrey K. Gurney, *Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles*, 2013 U. ILL. J.L. TECH. & POL'Y 247 (2013).

Impact of Autonomous Vehicles on Driver Liability

If the implementation of autonomous vehicle technology reduces the number and overall costs of crashes sufficiently, it is possible that the very need for specialized automobile insurance may disappear entirely. In this scenario, individual drivers are seen as less directly and solely responsible for their automobiles. Responsibility for the vehicle therefore shifts from the human driver to the car or its manufacturer, therefore shifting attribution of blame for automobile crashes. This reduction in fault of the driver can be viewed as roughly proportional to the extent that the technology controls the car (following the "continuums" noted *infra*). There may not be an at-fault driver to sue in crashes which involve drivers who reasonably rely on a car's ability to control itself. Also, the use of autonomous vehicles likely will serve to further dramatically decrease or even eliminate potential strict liability claims directed against drivers as drivers who use and rely upon fully autonomous vehicles will likely not be seen as engaging in an "ultrahazardous" activity.

Thus, implementation of autonomous vehicle technology would likely change distribution of harms caused by crashes, which would also have insurance consequences. The safety benefits and overall expected decrease in the expected probability of a crash and the associated lower insurance costs will probably encourage adoption of these technologies by drivers and automobile-insurance companies.

Products Liability Law

The current product liability law scheme provides the framework to seek remedies when an alleged defect in a product or misrepresentation of a product causes harm to a person or property.[8]

Plaintiffs in these suits usually raise multiple theories of liability in an effort to prevail on at least one. The most commonly asserted theories of liability are negligence and strict liability (which include claims for manufacturing defects, design defects, and failures to warn). These theories are or will be equally applicable to potential cases involving autonomous vehicles.

Liability of Manufacturers

- *Negligence* – Product manufacturers have a duty to exercise a reasonable degree of care in designing their products so that the products will be safe when used in reasonably foreseeable ways.

- *Strict Liability* – Under this theory of liability, even if a manufacturer exercised all possible care, the product could be sold with a defect or unintended flaw. If the defect causes injury to the user of the product, the manufacturer can be held strictly liable for damages. The liability is considered "strict" as it removes issues of negligence and is based upon consumer expectations that the product should not be unreasonably dangerous. These claims involve allegations of manufacturing defects, design defects and failure to warn.

[8] *See id.*; Dylan LeValley, *Autonomous Vehicle Liability – Application of Common Carrier Liability*, 36 SEATTLE U. L. REV. 5 (2013); John Villasenor, *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation,* in CENTER FOR TECHNOLOGY INNOVATION AT BROOKINGS – THE ROBOTS ARE COMING: THE PROJECT ON CIVILIAN ROBOTICS 2 (April 2014).

- *Manufacturing Defects* – This occurs when the product does not meet the manufacturer's specifications and standards. A plaintiff can prevail by showing the autonomous vehicle technology/equipment failed to work as specified by the manufacturer.

- *Design Defects* – This is alleged when the foreseeable risks of harm could have been reduced or avoided by the use of a reasonable alternative design. There are two primary tests for design defects:

    - *Consumer Expectations Test* – A product is alleged to have a design defect if it is dangerous to an extent beyond that which would be contemplated by the ordinary consumer who purchases it. While a manufacturer is not required to make perfectly safe goods, the court looks to what a reasonable consumer would expect from a product. In the autonomous vehicle context, the consumer would expect the vehicle to operate on its own in a reasonably safe manner.

    - *Risk-Utility Test* – The court examines whether the risks posed by an alleged design defect could have been avoided or reduced through the use of an alternative design that would not have impaired the utility of the product and/or unnecessarily increased costs. A plaintiff must present a reasonable alternative design that would have prevented the accident. In the autonomous vehicle context, design defect claims may allege a defect in the design of some tangible feature of the autonomous vehicle or in the software that controls the vehicle.

- *Failure to Warn* – This claim is based on a manufacturer's duty to provide instruction about how the product can be safely used and to warn consumers of risks. The focus for the court is whether the warnings/information provided was adequate. In the autonomous vehicle context, the main obligations of a manufacturer will likely be to inform drivers of any dangers they may face when using the technology and to instruct drivers how to use the autonomous vehicles safely. Post-sale updates/warnings of newly discovered risks are also an issue.

Defenses that are and will arguably be available to manufacturers and applicable to autonomous vehicle product liability suits include:

- *Comparative Negligence* – Driver or human action as an intervening and contributing cause of the harm and injury;

- *Product Misuse/Alteration* – Individual alters the technology or mechanical portions of the autonomous vehicle; or an individual improperly disregards directions for use of the autonomous vehicle before operation; and

- *State of the Art* – Vehicle manufacturer asserts that there was no safer alternative design when the autonomous vehicle was made, and that it used the safest design that could have been created given the materials and technical knowledge available at the time.

Recommendations for Handling Liability Issues

Accidents will always be an aspect of motor vehicle travel, and the liability questions that autonomous vehicles will raise are important and worthy of attention and further consideration. Great care should be taken in this area as these issues should not be allowed to prevent development of and consumer access to autonomous vehicle technology.

Because liability concerns may detrimentally slow the introduction of this technology, commentators have offered suggestions and opinions. These might be addressed by a variety of policymaker approaches, including tort preemption, a federal insurance backstop, the incorporation of a long-term cost-benefit analysis of the legal standard for reasonableness, or an approach that continues to assign liability to the human operator of the vehicle.[9] Legal scholarship generally predicts the anticipated shift in liability to a trend towards increased manufacturer liability with increased use of automation.[10] Some suggest enacting legislative liability to remove uncertainty for manufacturers. Others go further, suggesting that courts should hold autonomous vehicle manufacturers to the same standard as common carriers and that they should owe passengers the highest duty of care.[11]

Arguably, some of the concerns should be assuaged as the U.S. products liability law framework is well-equipped to address and adapt to the autonomous vehicle liability questions that will arise in the coming years.[12]

The most prudent approach should involve a deliberately cautious, wait and see approach.[13] Policymaker intervention to align the private and public costs of this technology may ultimately be justified once its costs and benefits are better known. Further research and experience can help us better understand these uncertainties. Aggressive policymaker intervention at this point is premature and would probably do more harm than good.

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[9] James M. Anderson, Nidhi Kalra, Karlyn D. Stanley, Paul Sorensen, Constantine Samaras, Oluwatobi A. Oluwatola, *Autonomous Vehicle Technology – A Guide for Policymakers,* in RAND CORPORATION RESEARCH REPORT SERIES (2014).

[10] *See* Dylan LeValley, *Autonomous Vehicle Liability – Application of Common Carrier Liability*, 36 SEATTLE U. L. REV. 5 (2013); Jeffrey K. Gurney, *Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles*, 2013 U. ILL. J.L. TECH. & POL'Y 247 (2013).

[11] Dylan LeValley, *Autonomous Vehicle Liability – Application of Common Carrier Liability*, 36 SEATTLE U. L. REV. 5 (2013).

[12] John Villasenor, *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation,* in CENTER FOR TECHNOLOGY INNOVATION AT BROOKINGS – THE ROBOTS ARE COMING: THE PROJECT ON CIVILIAN ROBOTICS 2 (April 2014).

[13] James M. Anderson, Nidhi Kalra, Karlyn D. Stanley, Paul Sorensen, Constantine Samaras, Oluwatobi A. Oluwatola, *Autonomous Vehicle Technology – A Guide for Policymakers,* in RAND CORPORATION RESEARCH REPORT SERIES (2014).